

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

MMB Docket No. **1781-0015**

Urquhart Reference: **SJB/P011701US**

Confirmation No. **8850**

Application of: **Lane et al.**

Group Art Unit: **1797**

Serial No. **10/521,884**

Examiner: **Amber R. Miller-Harris**

Filed: **October 20, 2005**

For: **Coalescing Filter Element**

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APPEAL BRIEF

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Sir:

This is an appeal to the Board of Patent Appeals and Interferences of the United
States Patent and Trademark Office from the rejection of the claims 1-9 of the above-

identified patent application. These claims have been finally rejected in an Office Action dated February 20, 2008. Please charge any and all government fees required for the filing of this Appeal Brief to Deposit Account No. 13-0014. Also, please provide any extensions of time that may be necessary and charge any fees that may be due to Deposit Account No. 13-0014, but not to include any payment of issue fees.

(1) REAL PARTY IN INTEREST

Domnick Hunter Limited of Birtley, County Durham, United Kingdom is the assignee of this patent application, and the real party in interest.

(2) RELATED APPEALS AND INTERFERENCES

None.

(3) STATUS OF CLAIMS

Claims 1-9 are pending in the application.

Claims 1-9 are finally rejected.

Claims 1-9 are being appealed.

Claims 1-9 are shown in the Claim Appendix attached to this Appeal Brief.

(4) STATUS OF AMENDMENTS

Appellants have filed no amendments subsequent to the final rejection contained in the Office Action mailed February 20, 2008.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is summarized as follows:

A first aspect of Appellants' invention relates to a coalescing filter element 2 for removing liquid droplets from a gas stream. (See, e.g., Appellants' Figs. 1-2; and specification at page 1, lines 1-2.) The filter element 2 includes a wall 4 which is made of a coalescing filtration material and which defines a hollow space 20 within it. (See, e.g., Appellants' Figs. 1-2; and specification at page 7, lines 16 through end of page, and page 8, lines 4-5.) The filter element 2 further includes an end cap 16 at one end of the element which has a port 18 in it through which gas is supplied to the hollow space 20 to flow through the wall 4 of the filtration material. (See, e.g., Appellants' Figs. 1-2; and specification at page 8, lines 4-5 and line 23 through end of page, and page 9, lines 1-2.) The end cap 16 includes a peripheral portion 26, 42 which engages the element wall 4 and a tube 22, 40 which extends into the hollow space 20 defined by the element wall 4, so that the port 18 in the end cap 16 includes an inner opening defined by the tube 22, 40 and at least one peripheral opening 28, 45 located between the tube 22, 40 and the peripheral portion 26, 42 of the end cap 16, with the tube 22, 40 extending beyond the peripheral opening(s) 28, 45 so as to deliver gas to a region of the element wall 4 which is remote from the end cap 16. (See, e.g., Appellants' Figs. 1-2; and specification at page 8, lines 4 through end of page, and page 9, lines 1-2 and 6-14.)

Claims Dependent on Claim 1 are summarized as follows:

The tube 22, 40 which defines the inner opening is supported by means of at least one vane 24, 44 which extends between it and the peripheral portion 26, 42 of the end cap 16. (See, e.g., Appellants' Figs. 1 and 2; and specification at page 8, lines 4-11, and page 9, lines 6-14.) The filter element 2 further includes at least three vanes 24, 44 extending between the tube 22, 40 and the peripheral portion 26, 44 of the end cap 16. (See, e.g., Appellants' Figs. 1 and 2; and specification at page 8, lines 4-11, and page 9, lines 6-14.) The vanes 44 are arranged so that they impart a helical flow to gas flowing through the peripheral openings 45, relative to the axis defined by the port. (See, e.g., Appellants' Fig. 2; and specification at page 9, lines 6-14.) The tube 22, 40 is located approximately centrally in the inlet port 18. (See, e.g., Appellants' Figs. 1 and 2; and specification at page 8, lines 8-11, and page 9, lines 10-12.) The ratio of the length of the tube 22, 40 measured from the edge of the element wall 4 where the end cap engages the wall 4, to the overall length of the wall 4, is at least about 0.1. (See, e.g., Appellants' Fig. 1; and specification at page 3, lines 15-17.) The ratio of the area of the inner opening in the port 18 to the total area of the peripheral opening (or openings) 28, 45 is not more than about 0.6. (See, e.g., Appellants' Fig. 1; and specification at page 3, lines 18-21.) The ratio of the area of the inner opening in the port 18 to the total area of the peripheral opening (or openings) 28, 45 is at least about 0.25. (See, e.g., Appellants' Fig. 1; and specification at page 3, lines 18-21) The tube 40 contains at least one vane 44 within it for imparting a helical flow to gas flowing through the tube 40, relative to the axis 48 of the tube 40. (See, e.g., Appellants' Fig. 2; and specification at page 9, lines 6-14.)

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-3 and 5-8 were rejected under 35 U.S.C. § 103 as being unpatentable over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and Gieseke et al. (US 6,143,049).

Claim 4 was rejected under 35 U.S.C. § 103 as being unpatentable over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and further in view of Gieseke et al. (US 6,143,049), and still further in view of Ross (US 2,754,970).

Claim 9 was rejected under 35 U.S.C. § 103 as being unpatentable over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and further in view of Gieseke et al. (US 6,143,049), and still further in view of Ross (US 2,754,970).

(7) ARGUMENT

I. First Rejection under 35 U.S.C. § 103 (Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and Gieseke et al. (US 6,143,049))

Claims 1-3 and 5-8 are not unpatentable under 35 U.S.C. § 103 as being obvious over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and Gieseke et al. (US 6,143,049)

Discussion Regarding Patentability of Claim 1

The invention defined by claim 1 is concerned with a specific problem which tends to reduce the life of a coalescing filter element. In particular, if contaminant droplets in a gas stream all collect on a particular region of a filtration material wall of the filter element, the element can become clogged in that region thereby requiring replacement of the element even though the filtration material present throughout the remaining portions of the element is still suitable for use. The present invention addresses this problem by providing structure which results in more even distribution of contaminant loading of the wall of the filter element. The structure includes an end cap with a tube that extends into a hollow space defined by the wall and a peripheral portion that engages the wall, with peripheral opening(s) being defined between the tube and the peripheral portion. The tube extends beyond the peripheral openings and includes an inner opening to deliver the contaminant gas stream to more central regions of the element wall, while the peripheral openings deliver the contaminated gas stream to regions of the wall close to the end cap.

Claim 1

Claim 1 recites the following limitations:

a wall which is made of a coalescing filtration material and which defines a hollow space within it, and an end cap ...

the end cap comprising a peripheral portion which engages the element wall and a tube which extends into the hollow space defined by the element wall, ...

the port in the end cap comprises an inner opening defined by the tube and at least one peripheral opening located between the tube and the peripheral portion of the end cap,

with the tube extending beyond the peripheral opening(s) so as to deliver gas to a region of the element wall which is remote from the end cap.

Proposed Combination of Guenter, Billiet, and Gieseke

Presumably, the first part of the Examiner's proposed combination is to modify the Guenter filter device by removing its end cap structure 1 and replacing it with Billiet's end cap 63 which results in a filter device that includes an end cap that has a peripheral portion which engages the filtration material wall and is configured so that gas supplied through its end cap port is delivered to the hollow space defined by the wall. (See Final Office Action at page 3, third to last line through page 4, line 3.) It appears another part of the Examiner's proposed combination is to modify the combined Guenter/Billet device to include a peripheral opening in its end cap as Gieseke purportedly teaches (item 146, Fig. 6). (See Final Office Action at page 4, lines 6-10). Also, the proposed modification presumably includes extending the tube (Guenter, item 6A) beyond the peripheral opening(s). (See Final Office Action at page 8, last line through page 9, line 3.) Additionally, it appears the proposed modification includes locating the peripheral opening(s) between the tube (Guenter, item 6A) and the peripheral portion of the *end cap* (Billiet, item 63). (See Final Office Action at page 9, lines 7-11.)

It is Not Reasonable to Combine Guenter, Billiet, and Gieseke as Proposed

None of the cited art discloses an end cap for a generally cylindrical filter element which provides dual channel access (e.g. a central tube with an opening and peripheral openings around the tube), much less dual channel access configured to spread the filtration load of a contaminated gas flow throughout the length of the filtration material wall. Indeed, Guenter's end cap 1¹ merely includes an inlet channel 2 and an outlet channel 3, while Billiet's end cap 63 only includes a single wide gas flow inlet, and Gieseke's structure 104² includes an *outlet* tube 83 and an inlet passage 146. However, the Examiner appears to assert that it would have been obvious to provide a second channel (i.e. the claimed peripheral opening(s)) to the combined Guenter/Billiet end cap "because this provides an air way for which gas can flow through." (See Final Office Action at page 4, lines 9-10.) Moreover, the Examiner states that it would have been obvious "that these passage ways [of Gieseke] (figure 6, object 146) could be between any tube and peripheral portion of any apparatus in order to provide an air way for which the gas can flow through." (See Final Office Action at page 9, line 7-11.)

Firstly, the end cap of the combined Guenter/Billiet device would already have an air way for gas to flow to the hollow space defined by the wall element. Indeed, according to the proposed combination of Guenter and Billiet (see Final Office Action at

¹ The Examiner appears to imply that Guenter's end cap 1 includes peripheral openings to assist in delivering gas to a hollow space in the filter element 5. (See Final Office Action at page 3, lines 10-12, and page 8, last line through page 9, line 3. The figure of Guenter clearly shows the contrary.

² Gieseke's structure 104 is not even part of the coalescer filter 76, but rather is it part of the polishing filter 77. (See, e.g., Gieseke at Fig. 3.) And the coalescer filter 76 simply includes a filter disc through which the gas stream entering the apparatus is required to pass (See, e.g., Gieseke at Fig. 6.) which is in no way comparable to the coalescing filter element of Appellants' claim 1.

page 3, third to last line through page 4, line 1), the end cap of the combined Guenter/Billiet device would include the Billiet end cap 63 which already includes a single wide gas inlet configured to allow air to flow therethrough. Redesigning the end cap 63 to include peripheral openings in addition to a tube opening would be unnecessary, and would make the end cap design more complex. Thus, it would not be rationale for one skilled in the art to undertake such a modification absent a compelling reason.

Moreover, modifying the end cap to include peripheral openings in addition to a tube opening would be inconsistent with the teachings of Guenter. Significantly, Guenter wants the flow of gas to be advanced through a prefilter 6, 6A (equated with the claimed *tube*) prior to being passed through the filter 5. Adding peripheral opening(s) to the end cap that are located between the tube and the peripheral portion would create passages for the gas flow to bypass the prefilter in direct conflict with the teachings of Guenter.

Accordingly, one skilled in the art would *not* have found it reasonable to combine Guenter, Billiet, and Gieseke in the manner proposed in the Office Action. Thus, a prima facie case of obviousness under 35 U.S.C. § 103 has not been established with regard to claim 1. Consequently, claim 1 is allowable over a combination of Guenter, Billiet, and Gieseke, and the Board of Appeals is requested to reverse the rejection of claim 1.

Other Points to Consider

The tube (circular baffle member) 145 of Gieseke (shown in Figs. 5 and 6) does not extend into the hollow space within the wall that is made of the filtration material 1172, 173 as called for in claim 1. Rather, the outlet tube 147 extends into the hollow

space of the filter, while the tube 145 is completely outside of the hollow space of the filter. No peripheral openings are provided in the cap 175 between the outlet tube 147 and the peripheral portion of the cap 175. (See Fig. 5 of Gieseke) Further, Gieseke's passageways 146 are defined between the inner wall 133 of the housing 80 and the tube 145 *which is located externally* to the coalescing filter element 170. Thus, at best, Gieseke teaches providing openings between a housing wall and a tube positioned *outside* of a filter element that defines a hollow space therein.

Thus, even if it would have been obvious to modify the Guenter device to incorporate the teachings of Gieseke so that the Guenter device would include peripheral openings (e.g. passageways 146) defined between an inner wall of a housing (e.g. Gieseke's inner wall 133 or Guenter's inner wall of housing 4) and a tube which is located *externally* to a filter element (such as Gieseke's filter element 170 or Guenter's coalescing filter element 5), the resulting combination would not arrive at the invention defined in Appellants' claim 1. Indeed, the resulting combination would not possess an end cap comprising at least one peripheral opening located between a tube which is located *internally* to a coalescing filter element and the peripheral portion of the end cap which is attached a wall of the coalescing element as required by Appellants' claim 1.

Further, Billiet does not disclose at least one peripheral opening defined in an end cap that is located between a tube which is positioned *internally* to a coalescing filter element and a peripheral portion of the end cap which is attached a wall of a coalescing element as required by Appellants' claim 1. Thus, Billiet cannot make up the above-identified deficiency in the cited art.

Discussion Re: Patentability of Claims 2-3 and 5-8

Each of claims 2-3 and 5-8 depends directly or indirectly from claim 1. As a result, each of claims 2-3 and 5-8 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 1.

II. Second Rejection under 35 U.S.C. § 103 (Guenter (DE 10019293) in view of Billiet (GB 2,126,497), Gieseke et al. (US 6,143,049), and Ross (US 2,754,970))

Claim 4 is not unpatentable under 35 U.S.C. § 103 as being obvious over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), Gieseke et al. (US 6,143,049), and Ross (US 2,754,970)

Claim 4 was rejected under 35 U.S.C. § 103 as being unpatentable over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and further in view of Gieseke et al. (US 6,143,049), and still further in view of Ross (US 2,754,970). Reconsideration of claim 4 is respectfully requested. Claim 4 depends indirectly from claim 1. As a result, claim 4 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 1.

III. Third Rejection under 35 U.S.C. § 103 (Guenter (DE 10019293) in view of Billiet (GB 2,126,497), Gieseke et al. (US 6,143,049), and Ross (US 2,754,970))

Claim 9 is not unpatentable under 35 U.S.C. § 103 as being obvious over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), Gieseke et al. (US 6,143,049), and Ross (US 2,754,970)

Claim 9 was rejected under 35 U.S.C. § 103 as being unpatentable over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and further in view of Gieseke et al. (US 6,143,049), and still further in view of Ross (US 2,754,970). Reconsideration of claim 9 is respectfully requested. Claim 9 depends directly from claim 1. As a result, claim 9 is allowable for, at least, the reasons hereinbefore discussed with regard to claim 1.

IV. Conclusion

Claims 1-3 and 5-8 are not unpatentable under 35 U.S.C. § 103 as being obvious over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and Gieseke et al. (US 6,143,049), and the Board of Appeals is respectfully requested to reverse this rejection of these claims.

Claim 4 is not unpatentable under 35 U.S.C. § 103 as being obvious over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and further in view of Gieseke et al. (US 6,143,049), and still further in view of Ross (US 2,754,970), and the Board of Appeals is respectfully requested to reverse this rejection of this claim.

Claim 9 is not unpatentable under 35 U.S.C. § 103 as being obvious over Guenter (DE 10019293) in view of Billiet (GB 2,126,497), and further in view of Gieseke et al. (US 6,143,049), and still further in view of Ross (US 2,754,970), and the Board of Appeals is respectfully requested to reverse this rejection of this claim.

Respectfully submitted,

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(8) CLAIM APPENDIX

1. A coalescing filter element for removing liquid droplets from a gas stream, which comprises a wall which is made of a coalescing filtration material and which defines a hollow space within it, and an end cap at one end of the element which has a port in it through which gas is supplied to the hollow space to flow through the wall of the filtration material, the end cap comprising a peripheral portion which engages the element wall and a tube which extends into the hollow space defined by the element wall, so that the port in the end cap comprises an inner opening defined by the tube and at least one peripheral opening located between the tube and the peripheral portion of the end cap, with the tube extending beyond the peripheral opening(s) so as to deliver gas to a region of the element wall which is remote from the end cap.

2. A filter element as claimed in claim 1, in which the tube which defines the inner opening is supported by means of at least one vane which extends between it and the peripheral portion of the end cap.

3. A filter element as claimed in claim 2, which comprises at least three vanes extending between the tube and the peripheral portion of the end cap.

4. A filter element as claimed in claim 2, in which the vanes are arranged so that they impart a helical flow to gas flowing through the peripheral openings, relative to the axis defined by the port.

5. A filter element as claimed in claim 1, in which the tube is located approximately centrally in the inlet port.

6. A filter element as claimed in claim 1, in which the ratio of the length of the tube measured from the edge of the element wall where the end cap engages the wall, to the overall length of the wall, is at least about 0.1.

7. A filter element as claimed in claim 1, in which the ratio of the area of the inner opening in the port to the total area of the peripheral opening (or openings) is not more than about 0.6.

8. A filter element as claimed in claim 1, in which the ratio of the area of the inner opening in the port to the total area of the peripheral opening (or openings) is at least about 0.25.

9. A filter element as claimed in claim 1, in which the tube contains at least one vane within it for imparting a helical flow to gas flowing through the tube, relative to the axis of the tube.

(9) EVIDENCE APPENDIX

None.

(10) RELATED PROCEEDINGS APPENDIX

None.